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Your attention is invited

**NEWS
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WATERWAYS
AND
HARBORS
DIVISION
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JOURNAL OF THE WATERWAYS AND HARBORS DIVISION
PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS



DIVISION ACTIVITIES

WATERWAYS AND HARBORS DIVISION

Proceedings of the American Society of Civil Engineers

NEWS

September, 1958

The Committee on Publications lost Mr. John Buckley, former Secretary of the Division, through death. Mr. Buckley has been replaced by Admiral W. Mack Angas. Mr. R. R. Shoemaker, member of the Committee on Ports and Harbors, also died recently and is being replaced by B. N. Hoffmaster.

PROGRAM FOR WATERWAYS AND HARBORS DIVISION SESSIONS AT NEW YORK CONVENTION

Mr. Robert J. Winters of the Committee on Sessions Programs has arranged for three sessions of the Division at the October convention in New York. The papers to be presented are as follows:

Monday - October 13, 1958

Morning - Committee on Research & Committee on Ports & Harbors

1. "Tidal Navigational Problems Below Wilson Dam" by Mr. Rex A. Elder, Head, Hydraulic Operations and Test Section, T.V.A.
2. "Model Studies of Navigation Conditions at New Ohio River Locks" by Mr. Eugene P. Fortson, Jr., M.A.S.C.E., Chief, Hydraulics Division and Harbors Branch, U. S. Army Engineer, Waterways Experiment Station, Vicksburg, Mississippi.
3. "Port of Rota, Spain" by Mr. Stephen M. Olko, Consulting Engineer, New York, New York.
4. "Terminal for Large Tankers in Central Sumatra" by Mr. Barnett Silveston, Partner, Tippetts-Abbett-McCarthy-Stratton.

Afternoon - Committee on Coastal Engineering

1. "Sand By-Passing at Santa Barbara, California" by R. L. Wiegel.
2. "Design of Inlets of Natural By-Passing" by Per Brunn.
3. "Financing of Sand By-Passing Installations" by Mr. Stephen R. Middleton.
4. "The Sand By-Passing Plant at Lake Worth Inlet, Florida" by Mr. Charles Senour.

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Tuesday - October 14, 1958

Morning - Committee on Navigation and Flood Control Facilities

1. "Passamaquoddy Power Development" by Brig. Gen. Alden K. Sibley.
2. "New York Barge Canal" by Edward C. Hudowalski, Assistant Superintendent of Operation and Maintenance (Canals).
3. "Terminal Docking Facilities for Super Tankers" by Mr. A. D. Quinn, Vice President and Chief Engineer, Frederick Snare Corporation.
4. "Deepening of Existing Wilson Lock Eliminates Third Lockage" by Mr. W. F. Emmons, Head Civil Engineer, T.V.A. and Mr. O. Lavik, Civil Design Engineer, T.V.A.

Princeton University is tentatively planning a two-day conference immediately following the New York Convention. It is planned that the program would feature papers on "Rough Water Berthing and Cargo Handling."

COMMITTEE ON COOPERATION WITH LOCAL SECTIONS REORGANIZED

Mr. Francis G. Christian, Chairman of the Committee on Cooperation with Local Sections reports that his committee has been reorganized and will hold a meeting in the near future for the purpose of formulating a program of activities. The new committee members are as follows:

Control Group:

<u>Name</u>	<u>Location</u>
Francis G. Christian, Chairman	Sacramento, California
Floyd D. Peterson	Washington, D. C.
Harvill E. Weller	Vicksburg, Mississippi
Howard A. Preston	Walla Walla, Washington
George A. Smith	Hobart, Indiana

Local Section Representatives

<u>Name of Representative</u>	<u>Location</u>	<u>Section Represented</u>
Joseph B. Converse	Mobile, Alabama	Alabama
Howard A. Preston	Walla Walla, Washington	Columbia
George A. Smith	Hobart, Indiana	Indiana
Paul G. Mayer	Ithaca, New York	Ithaca
J. Thornton Starr	Baltimore, Maryland	Maryland
Henry O. Mikelait, Jr.	Hialeah, Florida	Miami
Harvill E. Weller	Vicksburg, Mississippi	Mid-South
N. C. Magnuson	Wilmington, North Carolina	North Carolina
Alfred C. Winters	Tulsa, Oklahoma	Oklahoma
Francis G. Christian	Sacramento, California	Sacramento
Walter F. Lawlor	St. Louis, Missouri	St. Louis
Clifton T. Barker	Knoxville, Tennessee	Tennessee Valley (Knoxville Br.)
Basil W. Wilson	College Station, Texas	Texas

CALIFORNIA FORMS DIVISION OF SMALL CRAFT HARBORS

As a result of the rapid growth of recreational boating in California during the past few years, the Division of Small Craft Harbors was activated within the State's Department of Natural Resources in October 1957. The Division now has a small engineering staff and works under the policy direction of a five-man Commission appointed by the Governor. The main purposes of the Division are to assist the cities, counties, and harbor districts in the creation of boating facilities, both along the coast and in the inland lakes and rivers; provide engineering and economic consulting services for the local agencies; act as the state agency in negotiating with the federal government on waterways development problems of the state; and to construct and operate harbors or other boating facilities by the Division when there is the need and no local agencies can provide such facilities.

The Division is accepting applications for loans to the cities, counties and harbor districts of California to assist them in the planning stages of their waterways projects, repayable on a ten-year basis. Construction funds are also available for loans to these agencies, repayable on a twenty-year basis pending legislative approval of each loan. The Division can assist private associations and groups only with advice and guidance. Inquiries by anyone are welcomed, as it is the intention of the staff to be of assistance wherever possible to the boating public.

The Division has prepared certain mimeographed publications with which to advise interested personnel and public agencies concerning the requirements for state assistance as well as the procedures, specifications, and criteria approved or recommended by the Division for planning and developing small craft harbors and connecting waterways. The Chief of the new Division is H. G. Stevens and the Division Engineer is J. W. Dunham, A. M., ASCE. The Division office is located in Room 202D, State Office Building No. 1, Sacramento 14, California.

ST. LAWRENCE SEAWAY OPENED TO TRAFFIC

The U. S. portion of the St. Lawrence Seaway, consisting of two locks, a 10-mile canal and extensive channel dredging was opened to commercial traffic on July 4. For the remainder of the 1958 navigation season the new facilities will handle only the small 14-foot draft "canallers" which formerly used the 50-year old canals on the Canadian side. By next April, the four Canadian Seaway locks between Lake St. Francis and Montreal Harbor will be completed and the entire St. Lawrence will be open to ocean vessels drawing up to 25-1/2 feet. Instead of transiting 22 locks from tidewater to Lake Ontario, vessels will then pass through only seven locks. The new U. S. locks can fill or empty in only 7-1/2 minutes and with a minimum of turbulence.

The Buffalo Engineer District of the Corps of Engineers was design and contracting agent on the U. S. Seaway for the Saint Lawrence Seaway Development Corporation. The Corporation is now operating and maintaining the waterway in accordance with Public Law 358 which created the agency.

LIST OF SUGGESTED RESEARCH PROBLEMS COMPILED BY DIVISION COMMITTEE ON RESEARCH

The Division Committee on Research has prepared a preliminary list of suggested research projects related to waterways and harbors and appropriate

for study in small private laboratories. While the committee is not in a position to sponsor research itself, it can assist those who are interested in conducting such research by telling them what is needed and assisting them in contacting organizations which might sponsor such research.

The research projects suggested by the Committee are as follows:

A. Stream Channel Problems

1. Floor Channel Deterioration

The patterns of stream bed degradation and aggradation and the meandering of streams within confining floor control levees is of importance in modifications to streams by the construction of flood control works. Until the last 50 years the clearing of land for agricultural development increased the sediment load of streams; more recently, however, reservoirs tend to trap this sediment and reduce the sediment transport. The result today is that few streams have formed permanently stable channels which are in equilibrium with the limited sediment supplies and the regulated streamflows.

2. Bank Erosion by Wave Action

Wave action in navigation channels may result from waves generated by passing ships, small boats, or local winds. These waves may cause erosion of the banks or levee faces. Information is required on the character of the waves that are generated by these various means, but also the mechanisms of the erosion process.

B. Sediment Along Shorelines

1. Stream-Borne Supply of Sediment

One of the most important sources of sand to a coastline is that supplied by streams. To estimate the approximate quantity of sediment delivered to a particular section of coastline requires rather detailed information on the sediment and hydraulic characteristics of each individual stream. An appraisal of the reduction in the supply of sand to the coast as a result of reservoirs constructed on streams can be estimated only after a detailed study has been made of the changes proposed to the hydraulic characteristics of the stream along with the sediment characteristics obtained by field study.

2. Factors Affecting the Movement of Sediment by Wave Action

Mechanics of material movement and stability, physical characteristics of sediment affecting material movement, criteria for turbulent flow at the sea bottom, bottom character with sediment movement, scour of bottom by moving sediment, and shore and cliff erosion by scour.

3. Mechanics of Material Transport in the Littoral Zone

Suspended sediment and bed sediment.

4. Rate and Result of Onshore-Offshore Material Movement

Effect of wave characteristics, effect of sediment characteristics, effect of beach profile, effect of tide, and effect of currents other than wave generated currents.

5. Rate and Result of Alongshore Drift

Supply of material to problem area from littoral deposits outside of area, supply of material to beach from offshore area, supply of material to beaches by streams, supply of material to beaches from cliff erosion, supply of material to beaches by marine life deposits, and tracking bed input.

C. Waves

1. Wave Characteristics

Better statistical information on wave characteristics with the seasons is required. These data can be obtained by the use of wave recorders and weather charts.

2. Standing Waves and Seiches (Harbor Surging)

Origin, dimensions, and mechanics of internal movement, possibly for waterways in general as well as harbors.

3. Distribution of Time-variation of Dynamic Wave Forces

Type of force, type of structure, and surface characteristics of structure.

4. Wave Forces on Breakwaters

5. Ship Waves in Shallow Water

6. Ship Motion in a Seaway

7. Wind Tides

D. Structures

1. Functional Design and Effect of Man-made Structures

Design methods are needed to select a shore protection structure, such as jetties, breakwaters, groins, bulkhead, artificial fills. For example, principles to govern choice of the length and spacing of groins are not well established.

2. Structural Design Problems of Man-Made Structures

Stability factors, resistance of material, and design criteria for pile and sheet pile structures, pipe lines and cables. Precast, prestressed, and combined precast, prestressed and poured-in-place waterfront structures including the economics of various combinations of such materials.

Elastic fender systems for piers and bulkheads, i.e., the use of rubber and other spring material to supplant heavy timber fender systems; to include investigation of pier and wharf corner pile clusters.

Erosion and scour of foundations of piers.

3. Stability of Rubble Mound Breakwaters

4. Uplift factors applied in design of hydraulic structures

Research is needed to determine what percentage of area is affected by uplift pressure in a structure such as a dam, lock wall.

5. Protective coatings for steel and concrete materials submerged in both fresh and salt water.

E. Estuaries

1. Sources of Estuarine Sediments

The source of sediments which form the deposits in a bay, such as San Francisco Bay, are not known. Means of tracing sediments, possibly by radioactive methods from their source to their final point of deposition, or redeposition, are urgently needed. Such information would greatly aid in improving the planning of dredging operations in tidal waters.

2. Salt Water Intrusion and Salt Water Wedge Phenomena

3. Scale Effects in Harbor Models

F. Instrumentation

1. Sediment Sampler

A better means of sampling sediment is needed, especially in the zone of the heavier suspended sediment (fluff) found in estuaries between the solid bottom layer and the lighter collidal suspension above.

2. Improved Current Meters

A more sensitive current meter is needed which will simultaneously record direction as well as velocity of current patterns.

3. Cathodic Measuring and Protection Devices

The Engineering Foundation and the National Science Foundation have funds available to encourage and support research.

A Conference on Basic Research in Civil Engineering will be held in Washington, D. C. on September 10 and 11. The Conference will be sponsored by ASCE, the National Science Foundation and George Washington University.

CORPS OF ENGINEERS STUDIES SAN FRANCISCO BAY

The San Francisco District of the Corps of Engineers have contracted with the University of California for the use of radioactive tracers for studying silt movement in San Francisco Bay. The radioactive material will be introduced into the water at Mare Island Strait.

Verification studies on the hydraulic model of San Francisco Bay are nearing completion and the testing program should start this fall.

PORTS AND HARBORS COMMITTEE HAS NEW CHAIRMAN

Ben E. Nutter, Chief Engineer, Port of Oakland, has accepted the chairmanship of the Division's Ports and Harbors Committee. The other members of the Committee are Carmen Garrison, William F. Heavey, Horace W. McCurdy, George T. Treadwell, John D. M. Luttman-Johnson, B. N. Hoffmaster and Thomas J. Fratar.

TASK COMMITTEE OF COMMITTEE ON COASTAL ENGINEERING

In the January 1958 issue of the Waterways and Harbors Division Newsletter, the task committee assignments of the Committee on Coastal Engineering were reversed. The correct assignments are:

Employment and Design of Sand By-Passing Systems

Thorndike Saville, Jr., Chairman
W. Mack Angus
E. H. Dochant
S. R. Middleton

R. L. Weigel
Per Brunn
J. K. Rankin
Charles Senour

Use of Groins for Coastal Shore Protection

Kenneth Peel, Chairman
J. W. Dunham
W. J. Herron
Omar Lillevang

M. N. Lipp
G. M. Watts
J. W. Johnson

TRIBARS USED FOR BREAKWATER REPAIR IN HAWAII

For the repair of the breakwater at Nawiliwili Harbor on the Island of Kauai a new concrete shape called a "tribar", was developed by the Corps of Engineers because of the scarcity of suitable rock. The repair project is expected to take about one year and it is hoped that a paper will be prepared for presentation to ASCE on the performance of tribars.

INDUSTRIAL DEVELOPMENT BY PORT DISTRICT IN WASHINGTON

In the 1957 session of the Washington State Legislature, legislation was passed to allow acquisition of land by port districts for industrial development purposes. The legislation also permits port districts to use tax revenues for industrial development purposes. The law has been challenged in court and a favorable decision rendered by the Superior Court. This decision is now under review by the State of Washington Supreme Court. The Port of Tacoma industrial development plan includes extension of the Industrial District Waterway and the Hylebos Waterway, and the use of dredged material for land fill. The Port of Seattle development involves the extension of the Duwamish Waterway along the Duwamish and Green Rivers and construction of necessary regulating works. The Port of Bellingham industrial project involves dredging in Bellingham Harbor and filling of tide flat areas. The waterways work planned by these three ports together with construction of highways, railroads and utilities totals nearly 40 million dollars.

